

What is claimed:

1. A method for reversibly coupling a pumping cartridge to a reusable pump drive system, the method comprising:

5 providing the reusable pump drive system with a first pumping cartridge retaining component configured and positioned to enable it to engage a first portion of the cartridge, the first pumping cartridge retaining component being adjustable between a retaining position and a non-retaining position;

10 providing a driveshaft of the reusable pump drive system with a second pumping cartridge retaining component configured and positioned to enable it to engage a second portion of the cartridge comprising a portion of a piston shaft of the pumping cartridge, the second pumping cartridge retaining component being adjustable between a retaining position and a non-retaining position;

15 preparing the pumping cartridge for connection to the reusable pump drive system by placing a piston of the pumping cartridge in a selected position relative to a cylinder of the pumping cartridge;

inserting the pumping cartridge into the reusable pump drive system;

adjusting the first and second pumping cartridge retaining components to their non-retaining positions; and

20 moving at least one of the first and second pumping cartridge retaining components to its retaining position.

2. The method of claim 1, wherein the selected position is chosen so that the first portion of the cartridge and the second portion of the cartridge are separated by a distance enabling
25 both the first and second pumping cartridge retaining components to be positioned in their retaining positions.

3. The method of claim 2 wherein the selected position is obtained by the steps of:

30 moving the piston relative to the cylinder so that a distance separating the first portion of the pumping cartridge and the second portion of the pumping cartridge comprising a portion of the piston shaft is greater than an engaging distance separating the first portion of the pumping cartridge and the second portion of the pumping cartridge comprising a portion of the piston shaft; and

35 inserting the pumping cartridge into the pump drive system so that during insertion of the cartridge into the pump drive system the piston is moved into the selected position, wherein the distance separating the first portion of the pumping cartridge and the second portion of the pumping cartridge comprises the engaging distance.

4. The method of claim 1, wherein the selected position is indicated by a detectable position indicator.

5 5. The method of claim 1, further comprising after the moving step, the step of:
using the pumping cartridge in a medical pumping procedure.

6. The method of claim 1, wherein the selected distance is obtained by engaging the first portion of the pumping cartridge with the first pumping cartridge retaining component;
10 moving the driveshaft of the pump drive system to a first end of its range, wherein the driveshaft is in its distal-most position in which a distance between a distal end of the driveshaft and the cylinder is as small as possible; and then engaging the second pumping cartridge retaining component with the second portion of the pumping cartridge comprising the portion of the piston shaft.

15 7. The method of claim 1, wherein the pumping cartridge is constructed and arranged to enable it to withstand and generates a pressure of at least about 5,000 p.s.i., without failure or leakage.

20 8. A method for reversibly coupling a pumping cartridge to a driveshaft of a reusable pump drive system, the method comprising:
providing the reusable pump drive system with a first pumping cartridge retaining component configured and positioned to enable it to engage a first portion of the cartridge, the first pumping cartridge retaining component being adjustable between a retaining position
25 and a non-retaining position;
providing a driveshaft of the reusable pump drive system with a second pumping cartridge retaining component configured and positioned to enable it to engage a second portion of the cartridge comprising a portion of a piston shaft of the pumping cartridge, the second pumping cartridge retaining component being adjustable between a retaining position
30 and a non-retaining position;
inserting the pumping cartridge into the pump drive system;
adjusting the first pumping cartridge retaining component to the retaining position;
moving the driveshaft of the pump drive system to a first end of its range, wherein the driveshaft is in its distal-most position in which a distance between a distal end of the
35 driveshaft and the cylinder is as small as possible; and

engaging said second pumping cartridge retaining component with the second portion of the cartridge comprising a portion of the piston shaft of the pumping cartridge, so as to couple the piston shaft to the driveshaft.

- 5 9. A method for coupling a presterilized pumping cartridge to a reusable pump drive assembly, the method comprising:
- positioning a piston assembly portion of the pumping cartridge in a first position within the cylinder, the first position being proximal to an operating region of the cylinder in which a piston reciprocates during operation;
- 10 sterilizing at least a cylinder assembly portion of the pumping cartridge;
- inserting the cartridge sterilized in the sterilizing step into the pump drive assembly;
- engaging a first retaining component of the pump drive assembly with a first portion of the cartridge; and
- engaging a second retaining component of a driveshaft of the pump drive assembly
- 15 with the piston assembly portion of the cartridge.
10. The method of claim 9, further comprising before the sterilizing step, a step of sealing the pumping cartridge in sterilizable packaging.
- 20
11. The method of claim 10, further comprising after the sterilizing step, a step of removing the cartridge from the sterilizable packaging.